

Listing of the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Original) A sensor device comprising:
an optical storage medium; and
a sensor film comprising a polymer support in combination with an analyte-specific reagent applied to at least a portion of the optical storage medium.

Claim 2. (Original) The sensor device of claim 1 wherein the optical storage medium is selected from the group consisting of CDs, CD-Rs, CD-RWs, DVDs, DVD-Rs, DVD-RWs, DVD-5s, DVD-9s, DVD-10s DVD-18s, magneto-optical discs, and Blu-ray discs.

Claim 3. (Original) The sensor device of claim 1 wherein the polymer support is a gas-permeable polymer.

Claim 4. (Original) The sensor device of claim 1 wherein the polymer support is selected from the group consisting of poly(anilines), poly(thiophenes), poly(pyrroles), poly(acetylenes), poly(alkenes), poly(dienes), poly(acrylics), poly(methacrylics), poly(vinyl ethers), poly(vinyl thioethers), poly(vinyl alcohols), poly(vinyl ketones), poly(vinyl halides), poly(vinyl nitriles), poly(vinyl esters), poly(styrenes), poly(arylenes), poly(oxides), poly(carbonates), poly(esters), poly(anhydrides), poly(urethanes),

poly(sulfonates), poly(siloxanes), poly(sulfides), poly(thioesters), poly(sulfones), poly(sulfonamides), poly(amides), poly(ureas), poly(phosphazenes), poly(silanes), poly(silazanes), poly(benzoxazoles), poly(oxadiazoles), poly(benzothiazinophenothiazines), poly(benzothiazoles), poly(pyrazinoquinoxalines), poly(pyromellitimides), poly(quinoxalines), poly(benzimidazoles), poly(oxindoles), poly(oxoisindolines), poly(dioxoisindolines), poly(triazines), poly(pyridazines), poly(piperazines), poly(pyridines), poly(piperidines), poly(triazoles), poly(pyrazoles), poly(pyrrolidines), poly(carboranes), poly(oxabicyclononanes), poly(dibenzofurans), poly(phthalides), poly(acetals), poly(anhydrides), carbohydrates, and copolymers of monomeric constituents of the above.

Claim 5. (Original) The sensor device of claim 1 wherein the polymer support comprises a hydrogel.

Claim 6. (Original) The sensor device of claim 5 wherein the hydrogel is tied via radical cross-linking of hydrophilic polymers selected from the group consisting of poly(acrylic acids), poly(methacrylic acids), poly(hydroxyethylmethacrylates), poly(glyceryl methacrylates), poly(vinyl alcohols), poly(ethylene oxides), poly(acrylamides), poly(N-acrylamides), poly(N,N-dimethylaminopropyl-N'-acrylamides), poly(ethylene imines), sodium poly(acrylates), potassium poly(acrylates) polysaccharides, poly(vinyl pyrrolidones), cellulose derivatives, and copolymers of monomeric constituents of the above.

Claim 7. (Original) The sensor device of claim 5 wherein the hydrogel is a poly(hydroxyethylmethacrylate) hydrogel tied via chemical cross-linking with an agent

selected from the group consisting of N,N'-methylenebisacrylamide, polyethylene glycol diacrylate, triethylene glycol diacrylate, tetraethylene glycol dimethacrylate, tripropylene glycol diacrylate, pentaerythritol tetraacrylate, di-trimethylolpropane tetraacrylate, dipentaerythritol pentaacrylate, trimethylolpropane triacrylate, pentaerythritol triacrylate, propoxylated glyceryl triacrylate, ethoxylated pentaerythritol tetraacrylate, ethoxylated trimethylolpropane triacrylate, hexanediol diacrylate, and hexanediol dimethacrylate.

Claim 8. (Original) The sensor device of claim 5 wherein the hydrogel is a cellulose derivative tied via chemical cross-linking with an agent selected from the group consisting of dialdehydes, diepoxides, and polybasic acids.

Claim 9. (Original) The sensor device of claim 5 wherein the hydrogel is a graft copolymer of poly(ethylene oxide) with polymers selected from the group consisting of poly(ethyleneglycol), poly(acrylic acid), poly(vinyl pyrrolidone), poly(vinyl acetate), poly(vinyl alcohol), N,N-dimethylaminoethyl methacrylate, poly(acrylamide-co-methyl methacrylate), poly(N-isopropylacrylamide), and poly(hydroxypropyl methacrylate-co-N,N-dimethylaminoethyl methacrylate).

Claim 10. (Original) The sensor device of claim 5 wherein the hydrogel is a graft copolymer selected from the group consisting of poly(vinyl pyrrolidone)-co-polystyrene copolymers, polyurethanes, polyurethaneureas in combination with poly(ethylene oxide), polyurethaneureas in combination with poly(acrylonitrile)-co-poly(acrylic acid), poly(acrylonitrile) derivatives, poly(vinyl alcohol) derivatives, and poly(acrylic acid) derivatives.

Claim 11. (Original) The sensor device of claim 1 wherein the polymer support comprises a polymer blend.

Claim 12. (Original) The sensor device of claim 1 wherein the sensor film is selectively permeable to an analyte on the basis of size of the analyte.

Claim 13. (Original) The sensor device of claim 1 wherein the sensor film is selectively permeable to an analyte on the basis of phase of the analyte.

Claim 14. (Original) The sensor device of claim 1 wherein the sensor film is selectively permeable to an analyte on the basis of solubility of the analyte.

Claim 15. (Original) The sensor device of claim 1 wherein the sensor film is selectively permeable to an analyte on the basis of ion charge of the analyte.

Claim 16. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is selected from the group consisting of organic dyes, inorganic dyes, nanocrystals, nanoparticles, quantum dots, organic fluorophores, inorganic fluorophores, IR absorbing dyes, near infrared absorbing materials, UV absorbing dyes, photochromic dyes, and thermochromic dyes.

Claim 17. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is selected from the group consisting of xanthene dyes, acridine dyes, azo dyes, porphyrin dyes, phthalocyanine dyes, cyanine dyes, merocyanine dyes, styryl dyes, oxonol dyes, triarylmethane dyes, methylene blue, phenol blue, bromothymol blue and bromocresol green.

Claim 18. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is a light absorbing reagent selected from the group consisting of carbon black, photochromic quinones, photochromic viologens, spirooxazines, and spiropyrans.

Claim 19. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is responsive to light at about 200 nm to about 1100 nm.

Claim 20. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is responsive to light at about 300 nm to about 1000 nm.

Claim 21. (Original) The sensor device of claim 1 wherein the analyte-specific reagent is responsive to light at about 350 nm to about 950 nm.

Claim 22. (Original) The sensor device of claim 1 further comprising an adhesive to adhere the sensor film to the optical storage medium.

Claim 23. (Original) The sensor device of claim 22 wherein the adhesive comprises a pressure sensitive adhesive.

Claim 24. (Original) The sensor device of claim 1 further comprising a solvent-resistant overlayer over the sensor film.

Claim 25. (Original) The sensor device of claim 24 wherein the solvent-resistant overlayer is selected from the group consisting of random copolymers of tetrafluoroethylene and perfluoro-2,2-dimethyl-1,3-dioxole, perfluorosulfonate ionomers, and hydrogels.

Claim 26. (Withdrawn) A method for producing a sensor device comprising:
selecting an optical storage medium for use as a substrate;
selecting a polymer support;
adding an analyte-specific reagent to the polymer support to form a sensor film;
and
applying the sensor film to the optical storage medium.

Claim 27. (Withdrawn) The method of claim 26 wherein the step of selecting an optical storage medium for use as a substrate utilizes an optical storage medium selected from the group consisting of CDs, CD-Rs, CD-RWs, DVDs, DVD-Rs, DVD-RWs, DVD-5s, DVD-9s, DVD-10s DVD-18s, magneto-optical discs, and Blu-ray discs.

Claim 28. (Withdrawn) The method of claim 26 wherein the step of selecting a polymer support comprises selecting a chemically-selective polymer as the polymer support.

Claim 29. (Withdrawn) The method of claim 26 wherein the step of selecting a polymer support comprises selecting a size-selective polymer as the polymer support.

Claim 30. (Withdrawn) The method of claim 26 wherein the step of selecting a polymer support utilizes a polymer selected from the group consisting of poly(anilines), poly(thiophenes), poly(pyrroles), poly(acetylenes), poly(alkenes), poly(dienes), poly(acrylics), poly(methacrylics), poly(vinyl ethers), poly(vinyl thioethers), poly(vinyl alcohols), poly(vinyl ketones), poly(vinyl halides), poly(vinyl nitriles), poly(vinyl esters), poly(styrenes), poly(arylenes), poly(oxides), poly(carbonates), poly(esters), poly(anhydrides), poly(urethanes), poly(sulfonates), poly(siloxanes), poly(sulfides), poly(thioesters), poly(sulfones), poly(sulfonamides), poly(amides), poly(ureas), poly(phosphazenes), poly(silanes), poly(silazanes), poly(benzoxazoles), poly(oxadiazoles), poly(benzothiazinophenothiazines), poly(benzothiazoles), poly(pyrazinoquinoxalines), poly(pyromellitimides), poly(quinoxalines), poly(benzimidazoles), poly(oxindoles), poly(oxoisindolines), poly(dioxoisindolines), poly(triazines), poly(pyridazines), poly(piperazines), poly(pyridines), poly(piperidines), poly(triazoles), poly(pyrazoles), poly(pyrrolidines), poly(carboranes), poly(oxabicyclononanes), poly(dibenzofurans), poly(phthalides), poly(acetals), poly(anhydrides), carbohydrates, and copolymers of monomeric constituents of the above.

Claim 31. (Withdrawn) The method of claim 26 wherein the step of selecting a polymer support comprises selecting a polymer blend as the polymer support.

Claim 32. (Withdrawn) The method of claim 26 wherein the step of adding the analyte-specific reagent to the polymer support comprises depositing the analyte-specific reagent onto a pre-formed polymeric support.

Claim 33. (Withdrawn) The method of claim 32 wherein the step of depositing the analyte-specific reagent onto the pre-formed polymeric support occurs by a method selected from the group consisting of ink-jet printing, microarraying, robotic spotting, and screen printing.

Claim 34. (Withdrawn) The method of claim 26 further comprising placing the polymer support in a solvent and then adding the analyte-specific reagent to form the sensor film.

Claim 35. (Withdrawn) The method of claim 34 wherein the step of placing the polymer support in a solvent comprises placing an amorphous fluoropolymer in perfluoro(2-butyl tetrahydrofuran).

Claim 36. (Withdrawn) The method of claim 26 wherein the step of adding an analyte-specific reagent to the polymer support to form a sensor film utilizes an analyte-specific reagent selected from the group consisting of organic dyes, inorganic dyes,

nanocrystals, nanoparticles, quantum dots, organic fluorophores, inorganic fluorophores, IR absorbing dyes, UV absorbing dyes, photochromic dyes, and thermochromic dyes.

Claim 37. (Withdrawn) The method of claim 26 wherein the step of adding an analyte-specific reagent to the polymer support to form a sensor film utilizes an analyte-specific reagent selected from the group consisting of xanthene dyes, acridine dyes, azo dyes, porphyrin dyes, phthalocyanine dyes, cyanine dyes, merocyanine dyes, styryl dyes, oxonol dyes, triaryl methane dyes, methylene blue, phenol blue, bromothymol blue and bromocresol green.

Claim 38. (Withdrawn) The method of claim 26 wherein the step of adding an analyte-specific reagent to the polymer support to form a sensor film utilizes a light absorbing analyte-specific reagent selected from the group consisting of carbon black, photochromic quinones, photochromic viologens, spirooxazines, and spiropyrans.

Claim 39. (Withdrawn) The method of claim 26 wherein the step of applying the sensor film to the optical storage medium comprises using an adhesive to adhere the sensor film to the optical storage medium.

Claim 40. (Withdrawn) The method of claim 39 wherein the step of applying the sensor film to the optical storage medium comprises using a pressure-sensitive adhesive to adhere the sensor film to the optical storage medium.

Claim 41. (Withdrawn) The method of claim 39 wherein the step of applying the sensor film to the optical storage medium with an adhesive further comprises using a light source to cure the adhesive.

Claim 42. (Withdrawn) The method of claim 26 wherein the step of applying the sensor film to the optical storage medium further comprises wetting a surface of the optical storage medium with a solvent prior to applying the sensor film.

Claim 43. (Withdrawn) The method of claim 42 wherein the wetting of a surface of the optical storage medium with a solvent utilizes a solvent selected from the group consisting of 1-methoxy-2-propanol, isopropyl alcohol, ethyl alcohol, ethanol, and 2-propanol.

Claim 44. (Withdrawn) The method of claim 26 further comprising applying a solvent-resistant overlayer to the sensor film.

Claim 45. (Withdrawn) The method of claim 44 wherein the step of applying the solvent-resistant overlayer to the sensor film utilizes a solvent-resistant overlayer selected from the group consisting of random copolymers of tetrafluoroethylene and perfluoro-2,2-dimethyl-1,3-dioxole, perfluorosulfonate ionomers, and hydrogels.

Claim 46. (Withdrawn) A method for producing a sensor device comprising:
selecting a substrate;
selecting a polymer support;

selecting an optical storage medium for use as a substrate;
adding an analyte-specific reagent to the polymer support to form a sensor film;
exposing the sensor film to an analyte; and
applying the sensor film to the optical storage medium after exposure of the sensor film to the analyte to produce a sensor device.

Claim 47. (Withdrawn) The method of claim 46 wherein the step of applying the sensor film to the optical storage medium after exposure of the sensor film to the analyte comprises applying the sensor film to the optical storage medium so that the analyte-specific reagent is positioned between the optical disc and the polymer support.

Claim 48. (Withdrawn) The method of claim 46 wherein the step of applying the sensor film to the optical storage medium after exposure of the sensor film to the analyte comprises applying the sensor film to the optical storage medium so that the polymer support is positioned between the analyte-specific reagent and the optical disc.

Claim 49. (Withdrawn) The method of claim 46 wherein the step of selecting a polymer support utilizes a polymer selected from the group consisting of poly(anilines), poly(thiophenes), poly(pyrroles), poly(acetylenes), poly(alkenes), poly(dienes), poly(acrylics), poly(methacrylics), poly(vinyl ethers), poly(vinyl thioethers), poly(vinyl alcohols), poly(vinyl ketones), poly(vinyl halides), poly(vinyl nitriles), poly(vinyl esters), poly(styrenes), poly(arylenes), poly(oxides), poly(carbonates), poly(esters), poly(anhydrides), poly(urethanes), poly(sulfonates), poly(siloxanes), poly(sulfides), poly(thioesters), poly(sulfones), poly(sulfonamides), poly(amides), poly(ureas), poly(phosphazenes), poly(silanes), poly(silazanes), poly(benzoxazoles),

poly(oxadiazoles), poly(benzothiazinophenothiazines), poly(benzothiazoles), poly(pyrazinoquinoxalines), poly(pyromellitimides), poly(quinoxalines), poly(benzimidazoles), poly(oxindoles), poly(oxoisindolines), poly(dioxoisindolines), poly(triazines), poly(pyridazines), poly(piperazines), poly(pyridines), poly(piperidines), poly(triazoles), poly(pyrazoles), poly(pyrrolidines), poly(carboranes), poly(oxabicyclononanes), poly(dibenzofurans), poly(phthalides), poly(acetals), poly(anhydrides), carbohydrates, and copolymers of monomeric constituents of the above.

Claim 50. (Withdrawn) The method of claim 46 wherein the step of selecting a polymer support comprises selecting a polymer blend as the polymer support.

Claim 51. (Withdrawn) The method of claim 46 wherein the step of adding the analyte-specific reagent to the polymer support comprises depositing the analyte-specific reagent onto a pre-formed polymeric support.

Claim 52. (Withdrawn) The method of claim 51 wherein the step of depositing the analyte-specific reagent onto a pre-formed polymeric support utilizes a method selected from the group consisting of ink-jet printing, microarraying, robotic spotting, and screen printing.

Claim 53. (Withdrawn) The method of claim 46 wherein the step of selecting a polymer support comprises selecting an amorphous fluoropolymer dissolved in perfluoro(2-butyl tetrahydrofuran).

Claim 54. (Withdrawn) The method of claim 46 wherein the step of adding an analyte-specific reagent to the polymer support to form a sensor film utilizes an analyte-specific reagent selected from the group consisting of organic dyes, inorganic dyes, nanocrystals, nanoparticles, quantum dots, organic fluorophores, inorganic fluorophores, IR absorbing dyes, UV absorbing dyes, photochromic dyes, and thermochromic dyes.

Claim 55. (Withdrawn) The method of claim 46 wherein the step of applying the sensor film to the optical storage medium comprises using an adhesive to adhere the sensor film to the optical storage medium.

Claim 56. (Withdrawn) The method of claim 55 wherein the step of applying the sensor film to the optical storage medium comprises using a pressure-sensitive adhesive to adhere the sensor film to the optical storage medium.

Claim 57. (Withdrawn) The method of claim 46 wherein the step of applying the sensor film to the optical storage medium further comprises wetting a surface of the optical storage medium with a solvent.

Claim 58. (Withdrawn) The method of claim 57 wherein the step of wetting a surface of the optical storage medium with a solvent utilizes a solvent selected from the group consisting of 1-methoxy-2-propanol, isopropyl alcohol, ethyl alcohol, ethanol, and 2-propanol.

Claim 59. (Withdrawn) The method of claim 46 further comprising applying a solvent-resistant overlayer to the sensor film.

Claim 60. (Withdrawn) The method of claim 46 wherein the step of applying a solvent-resistant overlayer to the sensor film utilizes a solvent-resistant overlayer selected from the group consisting of random copolymers of tetrafluoroethylene and perfluoro-2,2-dimethyl-1,3-dioxole, perfluorosulfonate ionomers, and hydrogels.

Claim 61. (Withdrawn) A method for producing a sensor device comprising:
selecting a substrate;
selecting a polymer support;
adding an analyte-specific reagent to the polymer support to form a sensor film;
and
applying the sensor film to the substrate after exposure of the sensor film to the analyte.

Claim 62. (Withdrawn) The method of claim 61 wherein the step of applying the sensor film to the substrate after exposure of the sensor film to the analyte comprises applying the sensor film to the substrate so that the analyte-specific reagent is positioned between the substrate and the polymer support.

Claim 63. (Withdrawn) The method of claim 61 wherein the step of applying the sensor film to the substrate after exposure of the sensor film to the analyte comprises applying the sensor film to the substrate so that the reagent polymer support is positioned between the analyte-specific reagent and the substrate.